

1. Net area of Building 123,000 sq. ft.
2. Site, Design, Engineering, Supervision, etc. \$ 685,000
3. Estimated Improvement Cost \$3,693,000
4. Annual Rental of Space Comparable to New Building \$ 500,000
5. Estimated Number of Personnel to be Housed 348
6. Economically Useful Life of Building 50 yrs.

II. Cost Inclusions

A. Construction

1. Site, Design, Engineering, etc. \$ 685,000 (685,000) ✓

There is no discounting involved in this cost and consequently, the estimated cost is used. In the event that the site is expected to be acquired by exchange or use of a Government-owned site, the fair market value of the site should be used.

2. Improvement

Again no discounting is involved and the present value is the estimated cost.

3. Maintenance and Operation \$3,475,938

This total annual cost is computed by multiplying \$1.43 x net area of the building (123,000 sq. ft.). This yields \$175,890 which when multiplied by Figure I in Exhibit A (19.7620) will equal \$3,475,938 present value of a stream of \$175,890 payments in each of 50 years (economically useful life of building).

4. Repairs and Improvements \$ 784,380

This cost is assumed to escalate over the economically useful life of the building in the following manner:

<u>Range of Years</u>	<u>Cost per sq. ft.</u>
1 - 10	\$.10
11 - 20	.30

4. Repairs and Improvements (Cont'd)

<u>Range of Years</u>	<u>Cost per sq. ft.</u>
21-40	\$.50
41-50	1.00 / .20

The present value factor to be used for years 1 to 10 is Figure II in Exhibit A. To obtain the factor for the second period (years 10-20) Figure III must be reduced by Figure II yielding 5.0952. Similarly, the third period is obtained by subtracting Figure III from Figure IV yielding 5.3936. The fourth period is derived by subtracting Figure IV from Figure I yielding 1.3604. Therefore, the present value of the cost per sq. ft. is arrived at by multiplying these factors by the unit cost: $\frac{1}{2}\%$

$5\frac{1}{2}$						
7.5376	X .10	7.9127	X .10	=	.79127	10
4.4127	X .30	5.0952	X .30	=	1.52856	20
4.0958	X .50	5.3936	X .50	=	2.69682	40
.8854	X 1.00	1.3604	X 1.00	=	1.36042	50
		5.0952			6.64913	6.37707

The sum of these unit costs when multiplied by the net sq. ft. will yield the present value of the stream of R&I costs for the 50-year period. This factor then (6.377) can be used when the economically useful life is 50 years, the R&I costs are scheduled as above and the discount rate used is $4\frac{1}{2}\%$.

5. Impacted Area Payment

\$ 196,474

These payments are used to compute the cost to the Federal Government in compensating the local community for taxes foregone as a result of Government ownership. These payments are estimated as being equal to \$200 per child, with an average of one child per 7 employees or \$28.57 per employee. Number of Employees X Unit Payment X Present value factor for a 50-year stream of equal payments (Fig. I).

348 X 28.57 X 19.7620

TOTAL \$8,834,792

B. Leasing

Only one cost is pertinent for the leasing alternative, i.e., the annual comparable rental on a fully serviced basis. To determine the present value of a stream of equal payments over 50 years multiply Fig. I X the annual rental (\$500,000). Therefore, in this case it is shown that the construction alternative is 1,046,000 present-value dollars cheaper than the leasing alternative.

TOTAL \$9,881,000

- III. The difference between the cost of leasing and the cost of construction divided by the net assignable square feet in the project will produce a number which can be compared with other numbers to determine the relative cost advantage of one project over another project.

KING FUND
Periodic deposit will grow to \$1 at future date.

100 000 0000
 .88 997 5550
 .18 773 3601
 .33 743 6479
 .82 791 6395

.48 878 3875
 .24 701 4680
 .06 609 6533
 .22 574 4700
 .81 378 8217

.172 248 1817
 .164 666 1886
 .158 275 3528
 .152 820 3160
 .148 113 8081

.144 015 3694
 .140 417 5833
 .137 236 8975
 .134 407 3443
 .131 876 1443

.129 600 5669
 .127 545 6461
 .125 682 4930
 .123 987 0299
 .122 439 0280

.121 021 3676
 .119 719 4616
 .118 520 8051
 .117 414 6147
 .116 391 5429

.115 443 4459
 .114 563 1962
 .113 744 5281
 .112 981 9119
 .112 270 4478

.111 605 7796
 .110 984 0206
 .109 401 6920
 .109 855 6712
 .109 343 1466

.108 861 5804
 .108 408 6759
 .107 982 3492
 .107 580 7056
 .107 202 0184

.106 844 7107
 .106 507 3395
 .106 188 5421
 .105 887 2235
 .105 602 1459

.105 332 3191
 .105 076 7923
 .104 834 6867
 .104 605 1886
 .104 387 5437

.104 181 0518
 .103 985 0622
 .103 798 9695
 .103 622 2094
 .103 454 2558

PRESENT WORTH OF 1
What \$1 due in the future is worth today.

.956 937 7990
 .915 729 9512
 .876 296 6041
 .838 561 3436
 .802 451 0465

.767 895 7383
 .734 828 4577
 .703 185 1270
 .672 904 4277
 .643 927 6820

.616 198 7388
 .589 663 8649
 .564 271 6410
 .539 972 8622
 .516 720 4423

.494 469 3228
 .473 176 3854
 .452 800 3686
 .433 301 7884
 .414 642 8597

.396 787 4255
 .379 700 8857
 .363 350 1298
 .347 703 4735
 .332 730 5967

.318 402 8849
 .304 691 3731
 .291 670 6919
 .279 015 0162
 .267 000 0155

.255 502 4072
 .244 499 9112
 .233 971 2069
 .223 895 8917
 .214 254 4419

.205 028 1740
 .196 199 2096
 .187 750 4398
 .179 665 4926
 .171 928 7011

.164 525 0728
 .157 440 2611
 .150 660 5369
 .144 172 7626
 .137 964 3661

.132 023 3169
 .126 338 1023
 .120 897 7055
 .115 691 5842
 .110 709 6500

.105 942 2488
 .101 380 1424
 .097 014 4903
 .092 836 8328
 .088 839 0745

.085 013 4684
 .081 352 6013
 .077 849 3793
 .074 497 0137
 .071 289 0083

PRESENT WORTH OF 1 PER PERIOD
What \$1 payable periodically is worth today.

.956 937 7990
 1.872 667 7503
 2.748 964 3043
 3.587 525 6979
 4.389 976 7444

5.157 872 4827
 5.892 700 9404
 6.595 806 0674
 7.268 790 4961
 7.912 718 1771

8.528 916 9159
 9.118 580 7808
 9.682 852 4218
 10.222 825 2840
 10.739 545 7263

11.234 015 0491
 11.707 191 4346
 12.159 991 8034
 12.593 293 6218
 13.007 936 4515

13.404 723 8770
 13.784 424 7627
 14.147 774 8925
 14.495 478 3660
 14.828 208 9627

15.146 611 4476
 15.451 302 8206
 15.742 873 5126
 16.021 888 5288
 16.288 888 5443

16.544 390 9515
 16.788 890 8627
 17.022 862 0695
 17.246 757 9613
 17.461 012 4031

17.666 040 5772
 17.862 239 7868
 18.049 990 2266
 18.229 833 7182
 18.401 584 4203

18.566 109 4931
 18.723 549 7542
 18.874 210 2911
 19.018 383 0536
 19.156 347 4198

19.288 370 7366
 19.414 708 8389
 19.535 606 5444
 19.651 298 1684
 19.762 007 7785

19.867 950 0273
 19.969 330 1697
 20.066 344 6600
 20.159 181 4928
 20.248 020 5673

20.333 034 0357
 20.414 366 6370
 20.492 236 0163
 20.566 733 0299
 20.638 022 0382

PARTIAL PAYMENT
Annuity worth \$1 today. Periodic payment necessary to pay off a loan of \$1.

1.045 000 0000
 .533 997 5550
 .363 773 3601
 .278 743 6479
 .227 791 6395

.193 878 3875
 .169 701 4680
 .151 609 6533
 .137 574 4700
 .126 378 8217

.117 248 1817
 .109 666 1886
 .103 275 3528
 .097 820 3160
 .093 113 8081

.089 015 3694
 .085 417 5833
 .082 236 8975
 .079 407 3443
 .076 876 1443

.074 600 5669
 .072 545 6461
 .070 682 4930
 .068 987 0299
 .067 439 0280

.066 021 3674
 .064 719 4616
 .063 520 8051
 .062 414 6147
 .061 391 5429

.060 443 4459
 .059 563 1962
 .058 744 5281
 .057 981 9119
 .057 270 4478

.056 605 7796
 .055 984 0206
 .055 401 6920
 .054 855 6712
 .054 343 1466

.053 861 5804
 .053 408 6759
 .052 982 3472
 .052 500 7056
 .052 202 0184

.051 844 7107
 .051 507 3395
 .051 188 5821
 .050 887 2235
 .050 602 1459

.050 332 3191
 .050 076 7923
 .049 834 6867
 .049 605 1886
 .049 387 5437

.049 181 0518
 .048 985 0622
 .048 798 9695
 .048 622 2094
 .048 454 2558

PERIODS

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RATE
 4 1/2%

.045
 per period

ANNUALLY

If compounded annually nominal annual rate is

4 1/2%

SEMIANNUALLY

If compounded semiannually nominal annual rate is

9%

QUARTERLY

If compounded quarterly nominal annual rate is

18%

MONTHLY

If compounded monthly nominal annual rate is

54%

i = .045
 in = .09
 in = .18
 in = .54

$$v = \frac{1}{(1+i)^n}$$

$$v = \frac{1}{(1+i)^n}$$

$$d_n = \frac{1-v^n}{i}$$

$$\frac{1}{d_n} = \frac{i}{1-v^n}$$

$$n$$